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Theory of Reasoned Action

PEER INFLUENCES AND SUSCEPTIBILITY TO SMOKING AMONG CALIFORNIA ADOLESCENTS

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ABSTRACT

Using data from a diverse statewide sample of 10th-grade adolescents in California, in 1996–97, this study investigated the associations between peer influence variables and susceptibility to smoking. Peer influence variables included attitudes about the social consequences of smoking and subjective norms, as described by the Theory of Reasoned Action. Among never-smokers ($N = 2681$) and ever-smokers ($N = 4248$), attitudes about social consequences of smoking and subjective norms each were associated with an increased

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risk of susceptibility to smoking. The model explained a larger proportion of the variance in susceptibility among ever-smokers than among never-smokers. Results indicate that peer influences, including perceptions of the social consequences of smoking and perceived social norms, may make adolescents susceptible to smoking.

Key Words: Smoking; Tobacco; Adolescents; Social influences; Peers.

INTRODUCTION

Peer influences are among the most powerful determinants of adolescent smoking (1). Adolescents tend to congregate in friendship groups or clusters (2,3). The social norms of the peer cluster can exert powerful effects on the behavior of individual adolescents within the cluster, causing adolescents to develop smoking-related attitudes and behaviors that closely resemble those of their close friends. Consequently, numerous studies have shown that adolescents tend to develop smoking-related attitudes and behaviors that are similar to those of their close friends (4,5,6,7). These peer influences on smoking behavior can persist long after the end of adolescence; adolescents whose friends are smokers are more likely to become smokers in adulthood (8).

Because peers are so influential in the process of adolescent smoking initiation, many school-based smoking prevention programs employ strategies to address social influences (9), and those that do tend to be more effective than programs that emphasize information or fear appeals (10). The overwhelming use and effectiveness of the social influences paradigm supports the notion that peer influence is recognized as a major predictor of tobacco use among teens (for a more thorough discussion regarding prevention and cessation programs, see Sussman et al. (9). Because peer influences are associated so strongly with adolescent smoking and subsequently adult smoking, it is important to achieve a more complete understanding of the process by which peers affect smoking behavior.

The Theory of Reasoned Action as a Model for Understanding Peer Influences on Adolescent Smoking

The Theory of Reasoned Action (11) provides a framework for understanding how adolescent smoking behavior may develop, and the role that

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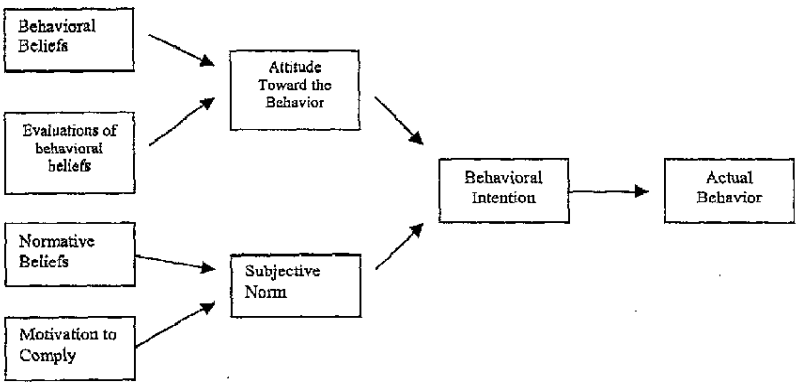

Figure 1. The theory of reasoned action (11).

peers may play in the process. This theory states that the most important determinant of health behaviors such as smoking is the intention to perform the behavior (Fig. 1). In other words, adolescents who intend to experiment with smoking (or who do not intend to avoid smoking) are more likely to try smoking. Intentions, in turn, are determined by attitudes toward the behavior and social norms. Attitudes toward the behavior consist of the individual's perception of the expected consequences of the behavior, weighted by the individual's perception of the importance or severity of these expected consequences. Subjective norms consist of the individual's perception of social network members' approval of the behavior, weighted by the individual's motivation to comply with the expectations of these social network members.

The Theory of Reasoned Action has been applied recently to such diverse health topics as breast feeding in low-income women (12), health care workers' glove use (13), condom use (14), and cigarette smoking (15). The continued popularity of the theory and its predictive ability suggest that it could be useful as a robust predictor of tobacco use.

Application of the Theory of Reasoned Action to Peer Influences on Adolescent Smoking

The Theory of Reasoned Action may be applied specifically to peer influences on adolescent smoking (Fig. 2). According to the theory, peer influences on adolescent smoking may be classified as either attitudes or

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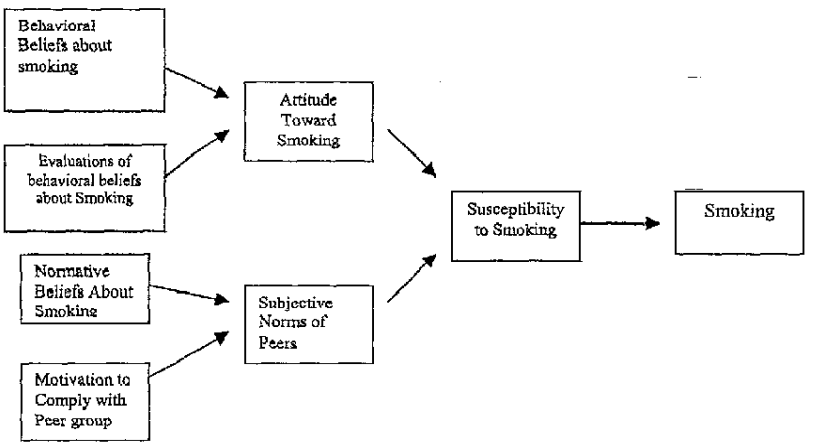

Figure 2. The theory of reasoned action applied to smoking (11).

subjective norms. Attitudes are determined by the expected consequences of the behavior and by the person's subjective evaluation of these consequences. Although the expected consequences of smoking include health consequences as well as social consequences, short-term social consequences tend to be more salient and important to adolescents than long-term health consequences (16). The potential social consequences of adolescent smoking include making new friends, approval from current friends, or being perceived as attractive, popular, or "cool" by peers. These and other social consequences of smoking are likely to be evaluated positively by adolescents. Attitudes about smoking may be positive to the extent that adolescents observe their smoking peers receiving positive social reinforcement. Attitudes may be less favorable to the extent that adolescents observe their smoking peers experiencing negative social consequences from smoking (17).

Subjective norms, in the Theory of Reasoned Action, are determined by the adolescent's perceptions of how important others want the adolescent to behave and the adolescent's motivation to comply with these people's wishes. For adolescents, important others tend to be friends and peers rather than adults; adolescents in general are motivated to comply with the norms of their peer group (2). The adolescent's perceptions of the prevalence and acceptability of smoking among their peers are likely determinants of social norms for smoking. Adolescents may form these perceptions by observing the smoking behavior of their close friends and other peers and using these observations to draw conclusions about the general prevalence and

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acceptability of adolescent smoking. These social norms for smoking may be exaggerated because of adolescents' tendency to overestimate the prevalence of smoking among their peers (18). Adolescents also may obtain cues about the prevalence and acceptability of smoking from the media, which tend to portray smoking as more prevalent than it actually is (19,20).

Susceptibility to Smoking

As described above, the Theory of Reasoned Action states that attitudes and subjective norms exert their influence on behavior by affecting intentions. According to this theory, attitudes and subjective norms lead to changes in intentions, which in turn lead to changes in the probability of smoking behavior. A similar theory has been proposed in the tobacco literature by Pierce and colleagues (21). Pierce describes a stage theory of adolescent smoking initiation called the Smoking Uptake Continuum, in which adolescents progress through a series of stages: never-smokers who are determined not to smoke (non-susceptible), never-smokers who are considering experimenting with cigarettes in the future (susceptible non-smokers), experimenters who have not yet become physiologically addicted, and addicted smokers.

Susceptibility to smoking (21) is a cognitive shift during this Smoking Uptake Continuum that precedes actual experimentation with cigarettes. Most young children intend never to try smoking. However, as they enter adolescence, they may begin to entertain the possibility that they may try smoking sometime in the future. When presented with the opportunity to try smoking, they may no longer respond with an automatic "no"; instead, they may reconsider new information about the acceptability of smoking and the expected consequences of smoking, thereby leaving themselves more vulnerable to pro-tobacco influences. This cognitive shift from absolute resistance to ambivalence defines susceptibility to smoking, and it is a significant risk factor for later experimentation (21). Susceptibility is an important construct in adolescent smoking research because it is an early step in a sequence of cognitive changes that ultimately results in experimentation with smoking and addiction to tobacco (21,22,23). Therefore, it is a risk factor for smoking that can be detected in adolescents before the smoking behavior actually occurs. Although the concept of a susceptibility stage of smoking initiation is rather new, recent research has demonstrated that susceptible adolescents are distinct from non-susceptible never-smokers and experimenters in their knowledge, attitudes, and beliefs about smoking. For example, during this stage between absolute refusal and experimentation, adolescents tend to become especially respective to pro-tobacco

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advertising (24). The susceptibility stage is the time when the perceived benefits of smoking may become more salient to the adolescent relative to the perceived risks. In this way, it is similar to the contemplation stage of change, during which the perceived benefits of a behavior change begin to outweigh the perceived risks (25). Susceptibility, therefore, is a transitional phase of behavior change, during which the adolescent re-evaluates the commitment to avoid smoking and becomes especially susceptible to pro-smoking influences.

How and why does the cognitive shift to susceptibility occur? Because peers play such an important role in the complex smoking initiation process, it is likely that they play a role in the development of susceptibility to smoking as well. Several studies have documented strong associations between peer smoking and susceptibility (23,26,27). The Theory of Reasoned Action predicts that peers influence susceptibility by influencing attitudes and/or subjective norms. However, the associations between the Theory of Reasoned Action constructs (attitudes and subjective norms) and susceptibility have not been tested empirically.

Also unknown is whether peer influences on susceptibility differ according to an adolescent's level of experience with smoking. Among adolescents who have never tried smoking, attitudes and subjective norms are based on observations or inferences about other people's smoking, rather than on direct personal experience. Because never-smokers do not have direct experience with the social consequences of smoking, they must rely on information gained through observational learning (17). Therefore, their perceptions about the positive social consequences of smoking and the prevalence of adolescent smoking may be distorted by unrealistic portrayals in the media (19,20) or incorrect information obtained from other people. Never-smokers who have exaggerated beliefs about the positive social consequences and norms about smoking may be especially susceptible to smoking.

Adolescents who have already tried smoking, in contrast, have first-hand knowledge about the social consequences and social norms regarding smoking. They may have more realistic knowledge about their peers' attitudes towards smoking, which usually tend to be negative (28). Because they may have more direct knowledge about the social consequences and social norms about smoking, their perceptions may be more accurate, and they may be less vulnerable to exaggerated or unrealistic expectations about the ways that their social lives might improve if they smoked. However, adolescents who have tried smoking are more likely to have smokers in their social networks (26). So the social norms among their close friends actually may be more supportive of smoking compared with the social norms of their peers in general.

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Based on the postulated differences between never-smokers and ever-smokers described above, it is not clear which group would be most strongly affected by peer influences to smoke. Perhaps peer influences affect never-smokers more strongly, because never-smokers have less direct information with which to counter-argue the peer and media messages about the social benefits of smoking. Consistent with this notion, Hu and colleagues (29) found a stronger association between friends' smoking and respondents' smoking behavior among never-smokers than among ever-smokers. Conversely, however, peer influences may affect ever-smokers more directly, because they have more direct experience with the social consequences and social norms related to smoking, and because they may perceive smoking-related information as more personally relevant.

This study used data from the Independent Evaluation of the California Tobacco Control, Prevention, and Education Program to evaluate the associations between peer influence variables, susceptibility to smoking, and smoking behavior among 10th-grade students in California. Using the Theory of Reasoned action as our model, we hypothesized that the respondents' attitudes about the perceived social consequences of smoking and subjective norms would be associated with susceptibility to smoking.

METHODS

This study used data from a representative sample of 10th-grade California youth ($N=6929$). The data were collected in 65 schools in 18 California counties, and the sample has been weighted to represent the population of California youth enrolled in public schools. The data were collected during the 1996–97 school year as part of the Independent Evaluation of the California Tobacco Control Prevention and Education Program (30). As part of the Independent Evaluation, high schools were selected randomly within each of 18 California counties, and classrooms of students were selected randomly within schools. Because the surveys were anonymous, an implied parental consent procedure was used (students were assumed to have parental consent if their parents did *not* return a signed form declining their children permission to participate). Even if their parents did not decline participation, students were free to decline participation. Of the students in the selected classrooms, 96% provided parental and student consent and completed the survey; these 6929 students comprise the sample. Students completed a 150-item survey during a single class period (45–50 minutes).

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Measures

The survey was designed to assess exposure to specific components of the California Tobacco Control Program. Questions about smoking behavior and psychosocial variables related to smoking were included; these questions have been validated and described in detail in previous studies (30). Because the study used an implied consent procedure, the California Education Codes prohibited us from including questions about "family life," which includes family members' smoking behavior. Therefore, questions about family did not appear on the survey. The questions used in this analysis have been described in detail elsewhere (30) and are described briefly below.

Attitudes about perceived social consequences of smoking included the following questions, each rated on Likert-type scales: "How would your best friends act if you smoked cigarettes?" (rated on a 4-point scale ranging from "very friendly" to "very unfriendly"), "Young people who smoke cigarettes have more friends," (rated on a 4-point scale ranging from "yes, definitely" to "no") and "Smoking cigarettes makes young people look cool" (rated on a 4-point scale ranging from "yes, definitely" to "no").

Subjective norms included three types of variables, each of which addressed the respondents' perceptions that smoking is a normative behavior. These variables included *perceived social norms* ("Do most people your age think it's OK to smoke cigarettes once in a while?" [rated on a 4-point scale ranging from "yes, definitely" to "no"] and "Out of every 100 students your age, how many do you think smoke cigarettes once a month or more?" [rated on an 11-point scale ranging from "none of them" to "about 100"]); *exposure to smoking* (number of days in past week in room or car with someone smoking; rated on a 5-point scale ranging from "0 days" to "7 days"); and self-reported *cigarette offers* in the past month (rated on a 5-point scale ranging from "none" to "5 or more times").

Demographic covariates included age, gender, ethnicity, and language spoken at home. Age was coded in years. Gender was coded as a dichotomous variable. For ethnicity, respondents were given a list of ethnic categories and allowed to check as many categories as applied. Dummy variables were created for the categories of White, African-American, Hispanic/Latino, Asian American, and Other. Language spoken at home (an indicator of acculturation) was assessed with a 5-point scale ranging from "only English" to "only another language."

Smoking status. Respondents were classified as never smokers if they responded "no" to the question, "Have you ever tried cigarette smoking, even a few puffs?" If they responded "yes" to this question, they were classified as ever smokers.

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Susceptibility was indicated by any response other than "definitely not" to one or more of the following questions: "*If one of your best friends were to offer you a cigarette, would you smoke it?*" and "*At any time during the next year, do you think you will smoke a cigarette?*" (21).

Data Analysis

Logistic regression analyses were performed to assess the independent contribution of each peer influence variable to smoking susceptibility, controlling for the other peer influence variables in the model and the demographic covariates. The logistic regression models were run separately for never-smokers and ever-smokers. To account for the intraclass correlation that might result from the complex sampling design, random effects were included for sampling strata, county, and school, using the GLIMMIX macro in SAS (31).

RESULTS

Demographic Characteristics of Sample

The respondents in this sample were a diverse group of 10th-grade adolescents. Their demographic characteristics closely resembled those of the California population (30) and are shown in Table 1. The mean age of the respondents was 15.3 years (standard deviation 0.6 years). The never-smokers were significantly younger than the ever-smokers. As shown in Table 1, the sample was ethnically diverse, reflecting the California population. Just under half of the sample was White. The sample contained sizable proportions of adolescents who self-identified as Hispanic/Latino (most of whom were Mexican-American) and Asian American/Pacific Islander (including Chinese, Korean, Filipino, Vietnamese, and Japanese). Other ethnic minorities included African Americans, Native Americans/Alaskans, and students from Middle Eastern countries who did not consider themselves to be White. There were several ethnic differences in smoking behavior. Never-smokers were significantly more likely to be African American or Asian American, and significantly less likely to be white, Hispanic/Latino, or other ethnicities. Susceptibility to smoking was significantly more common among ever-smokers than among never-smokers.

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Table 1. Selected Demographic Characteristics of 10th-Grade Respondents

	Never-smokers ($N = 2681$)	Ever-smokers ($N = 4248$)	Chi-square
Age (years)			
13–14	4%	2%	57.52*
15	74%	68%	
16	21%	28%	
17–18	1%	1%	
Gender			
Male	50%	51%	1.19
Female	50%	49%	
Ethnicity[1]			
White	46%	49%	6.01*
African American	8%	7%	.97
Hispanic/Latino	22%	30%	47.84*
Asian American	26%	18%	55.95*
Other	8%	11%	13.43*
Susceptibility			
Yes	24%	79%	2006.00*
No	76%	21%	

[1]The sum of the percentages is greater than 100% because some respondents selected more than one ethnic group.
*$p < .05$.

Correlations Among Peer Influence Variables

Table 2 shows the correlations among the peer influence variables. All of the peer influence variables were significantly intercorrelated at $p < .05$, but most of the correlations were small to moderate. The correlations ranged from .06 to .46. Although the independent variables were significantly intercorrelated, the collinearity diagnostic test in SAS indicated that the correlations were not large enough to produce multicollinearity (condition index = 16.62).

Associations Between Peer Influence Variables and Smoking Susceptibility/Behavior

Table 3 shows the odds ratios for susceptibility among never-smokers and ever-smokers, according to the respondents' responses to the peer influence questions. These results are controlled for the demographic variables shown in the table (age, gender, and ethnicity).

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Anamara Ritt-Olson, M.A., is a predoctoral student in Preventive Medicine at the University of Southern California School of Medicine. Her research interests include psychosocial predictors of health behaviors among adolescents. Currently she is focusing on the role of protective factors on health such as spirituality and the value placed on health. Her dissertation will look at predictors of smoking cessation among adolescents of different ethnicities.

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Table 3. Odds Ratios of Susceptibility to Smoking, According to Peer Influences

	Never-smokers		Ever-smokers	
Variable	OR	95%CI	OR	95% CI
Demographics				
Age	0.80*	(0.66, 0.97)	0.95	(0.81, 1.11)
Female gender	1.39*	(1.13, 1.70)	1.35*	(1.13, 1.60)
White	1.20	(0.86, 1.67)	1.12	(0.86, 1.46)
African-American	0.62	(0.35, 1.09)	0.70	(0.46, 1.05)
Hispanic/Latino	1.84*	(1.29, 2.63)	1.33	(1.00, 1.77)
Asian American	0.93	(0.64, 1.34)	1.00	(0.72, 1.38)
Other ethnicity	0.94	(0.53, 1.67)	1.24	(0.80, 1.94)
Attitudes about perceived social consequences of smoking				
Best friends would act friendly if you smoked	1.58*	(1.40, 1.79)	1.82*	(1.63, 2.03)
Young people who smoke cigarettes have more friends	1.14	(1.00, 1.29)	1.10	(0.98, 1.24)
Smoking cigarettes makes young people look cool	1.69*	(1.46, 1.96)	1.73*	(1.49, 2.02)
Subjective norms				
Most people your age think it's OK to smoke cigarettes once in a while	1.05	(0.92, 1.20)	1.21*	(1.07, 1.36)
Prevalence estimate of peer smoking	1.00	(0.99, 1.00)	1.00	(0.99, 1.00)
Exposure to smoking in past week	1.01	(0.94, 1.09)	1.07*	(1.01, 1.14)
Cigarette offers in past month	1.27*	(1.17, 1.39)	1.49	(1.40, 1.58)

*95% Confidence intervals that do not include 1.00 are significant at $p < .05$.

variables, when added to a model containing only the demographic and attitude variables, explained 3% of the variance in susceptibility among never-smokers and 10% of the variance among ever-smokers.

DISCUSSION

The results of this study indicate that peer influence variables are associated with susceptibility to smoking among both never-smokers and ever-smokers, although they explained a larger proportion of the variance among ever-smokers. These peer influence variables include attitudes

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about the perceived social consequences of smoking (e.g., eliciting positive reactions from friends, being "cool") and subjective norms (perceived social norms, exposure to smokers, and cigarette offers). These peer influence variables may increase adolescents' willingness to consider smoking in the future (susceptibility), which may in turn increase the likelihood that they will experiment with cigarettes. This interpretation is consistent with the Theory of Reasoned Action, which specifies that attitudes and subjective norms will influence intentions (or susceptibility), which will then lead to behavior change.

The group of attitude variables explained a larger proportion of the variance in susceptibility than did the group of subjective norm variables. This indicates that the perceived social consequences of smoking may be more important in an adolescent's decisions about smoking, compared with the motivation to conform to peer norms. Because most 10th-grade students in California do not smoke, the respondents may not have viewed smoking as normative or typical. However, if they view smoking as a way to make friends, increase their popularity, or present themselves as "cool," they may be motivated to experiment with smoking. For these students, therefore, smoking may be a means of distinguishing oneself from the crowd, rather than an effort to conform.

These results have important implications for school-based smoking prevention programs. Adolescents may become susceptible to smoking because they believe that smoking will have positive social consequences, such as popularity and approval from friends. Through classroom-based activities, smoking prevention programs may be able to demonstrate to adolescents that most of their peers in fact disapprove of smoking. For example, in one popular classroom activity, students are asked to stand in one side of the classroom if they think it is acceptable for an adolescent to smoke, or to stand in the opposite side of the classroom if they think adolescent smoking is not acceptable. Most students tend to stand on the "non acceptable" side of the room, demonstrating that adolescent smoking is not normative or acceptable within the peer group. If adolescents can be shown that smoking does not have the expected positive social consequences, perhaps they will be less motivated to smoke.

Because adolescent smoking is a complex, dynamic process with multiple interrelated causes, attempting to change adolescents' attitudes and norms about smoking is only one of many potential strategies for smoking prevention. Other strategies include policies to prevent cigarette sales to minors, policies prohibiting smoking in indoor public areas where adolescents congregate, media campaigns to change social norms and educate the public about the risks of smoking, and cigarette taxes to make cigarettes too expensive for adolescents' budgets. A combination of psychosocial

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strategies (such as altering attitudes and subjective norms) and some of these policy strategies may be the most effective way to prevent adolescent smoking (10).

Limitations

There are several limitations to this research. Because these data are cross-sectional, they do not imply causal associations. Peer influences may affect smoking behavior, but smoking behavior also might lead to changes in an adolescent's peer group affiliation, attitudes, and/or perceptions of social norms.

These data are based on adolescents' self-reports of their peer influences and smoking behavior. Because the survey was anonymous, the respondents probably would not have been motivated to bias their self-reports of their smoking behavior; however, the respondents may have under- or over-reported their smoking. In addition, the peer influence variables were subjective, so they indicate the respondents' perceptions of their social climate rather than their peers' actual behavior.

This survey did not contain questions about family influences on smoking. The California Education Code requires that all in-school surveys that address "family life" issues must use an active written parental consent procedure, rather than the implied consent procedure that was used in this study. The use of active consent may have decreased the participation rate, because many students forget to return their parental permission forms, resulting in a less representative sample. Therefore, the decision was made not to ask about family influences in this survey. Because family members do influence adolescent smoking to some degree (32), further research should address both peer and family influences.

Despite these limitations, these results indicate that several different aspects of peer influence may increase the risk of susceptibility to smoking among adolescents, including perceived positive social consequences of smoking and perceived subjective norms consistent with smoking. These results extend the results of previous research by applying the Theory of Reasoned Action to the prediction of susceptibility, an early cognitive marker for future smoking initiation. This study indicates that attitudes and subjective norms, as described by the Theory of Reasoned Action, may lead to an erosion of an adolescent's firm resolve *not* to smoke, which may later evolve into an intention to experiment with smoking.

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Future Directions

These results generate some important research questions for further study. This study indicates that attitudes and subjective norms, which are learned from peers, may lead to susceptibility to smoking among adolescents. However, it is not clear whether it is possible to inoculate adolescents against these peer influences with health education programs. Further research is needed to determine which health education strategies are most effective in preventing susceptibility to smoking.

Further research also is needed to understand the circumstances under which adolescents receive social reinforcement for smoking. Despite the proliferation of anti-tobacco messages in the media, in school health education programs, and in community programs, and despite the fact that most adolescents and adults in California are not smokers, some adolescents still appear to view smoking as a way to gain approval or status among their peers. Research is needed to determine how and why this occurs, and whether it can be prevented. If smoking can be reframed as an undesirable behavior among adolescents, as it has been among adults in California and some other U.S. states, perhaps much of adolescent smoking can be prevented. Prevention of adolescent smoking at the susceptibility stage could decrease the number of adolescents who progress to experimentation and addiction.

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RESUMEN

Usando los datos de un grupo diverso do adolescentes en el decimo grado por todo el estado de California, este estudio investigó las influencias que tienen los companeros sobre el fumar. Estos variables incluyen las actitudes acerca de las consecuencias sociales de fumar y normas subjetivas, describidos por la Teoria de la Acción Razonada. Entre los estudiantes que nunca han fumado ($N = 2681$) y estudiantes que han fumado ($N = 4248$), las actitudes acerca de las consecuencias sociales de fumar y las normas subjetivas fueron asociadas con un reisgo aumentado de susceptibilidad a fumar. El modelo explicó que la proporción de variacion entre la susceptibilidad entre estudiantes que han fumado era mas grande que la proporción de variacion entre estudiantes que nunca han fumado. Los resultados indican que las influencias que tienen los companeros incluyendo las percepciones de las consecuencias sociales de fumar y normas sociales percibidas, pueden causar que adolescentes sean susceptibles a fumar.

RÉSUMÉ

Avec les données d'un divers échantillon des élèves secondaires de dixième année en Californie, cette étude a examiné les associations entre les variables d'influence de pair et la susceptibilité à fumer. Les variables d'influence de pair ont compris des attitudes des conséquences sociales et les

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normes subjectives, comme décrit par la Théorie d'action raisonnée. Entre ceux qui ont essayé de fumer dans le passé ($N=2681$) et ceux qui n'ont jamais fumé ($N=4248$), les attitudes des conséquences sociales et les normes subjectives chaque ont été associé á un risque augmenté de susceptibilité à fumer. Le modèle a expliqué une plus grande proportion de la variance dans la susceptibilité parmi ceux qui ont essayé de fumer auparavant que parmi ceux qui n'ont jamais fumé. Les résultats indiquent que l'influence de pair, y compris les perceptions des conséquences sociales et des normes sociales, peut faire des adolescents susceptibles à fumer.

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